Práctica 2 - Potenciación. Radicación. Logaritmos.

1. Reduce

$$E = \frac{6m^5m^8}{m^7} + \frac{14mn^{12}}{m^4 \cdot m^3} - \frac{13m^3m^{10}}{m^5 \cdot m^2}$$

2. Calcula

$$F = \underbrace{4 \times 4 \times \cdots \times 4}_{20 \text{ factores}} - \underbrace{16 \times 16 \times \cdots \times 16}_{10 \text{ factores}}$$

3. Calcula

$$B = \frac{15^3 \times 6^4}{9^3 \times 4^2 \times 125}$$

4. Calcula

$$A = \left[\left(\frac{4}{7}\right)^{-1} + \left(\frac{2}{5}\right)^{-2} + \left(\frac{1}{2}\right)^{-3}\right]^2$$

5. Calcula

$$B = \left(\frac{2}{3}\right)^6 \left(\frac{9}{4}\right)^9 \left(\frac{8}{27}\right)^4$$

6. Calcula

$$E = \frac{5^{3x+2} + 5^{3x+4} + 5^{3x+3}}{5^{x+1} \cdot 5^x \cdot 5^{x+1}}$$

7. Calcula

$$A = \frac{3^{n+6} + 3^{n+5}}{3^{n+4} + 3^{n+3}}$$

8. Si $x^x = 5$. Halle

$$A = \frac{\left(x^3\right)^x}{\left(x^4\right)^x}$$

9. Simplifica

$$B = \frac{3^{n^{n+3}} - 3\left(3^{n^n}\right)}{3\left(3^{n^{n-1}}\right)}$$

10. Calcula

$$E = \frac{42^6 \times 35^3 \times 40^3}{15^4 \times 14^9 \times 30^2}$$

11. Simplifica

$$A = \frac{\underbrace{(3 \times 3 \times \cdots \times 3)}_{30 \text{ veces}} - \underbrace{(2 \times 2 \times \cdots \times 2)}_{20 \text{ veces}}}{3^{30} - 2^{20}}$$

12. Calcula

$$C = -(7)^0 + (-7)^0 + \left(\frac{1}{3}\right)^{-1} + \left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{4}\right)^0$$

13. Reduce

$$A = 2^{2^{1^{2^3}}} + 3^{2^{0^{3^2}}} + \left(3^2\right)^3 + 1^{2^3} - 3^6$$

14. Calcula

$$A = 8^{-3^{-1}}$$

15. Calcula

$$B = 27^{-81^{-4^{-1}}}$$

16. Simplifica

$$C = \underbrace{\sqrt[4]{5} \cdot \sqrt[4]{5} \cdot \ldots \cdot \sqrt[4]{5}}_{24 \text{ factores}} + \left(-5^2\right)^3$$

17. Calcula

$$A = \left(\left(\sqrt{7}\right)^0 + 27^{\frac{1}{3}} + 64^{\frac{1}{3}}\right)^{\frac{1}{3}}$$

18. Calcula

$$A = \left[27^{-81^{-16^{-\frac{1}{2}}}}\right]^{-2}$$

19. Simplifica

$$\left(\frac{1}{3}\right)^{-\left(\frac{1}{9}\right)\left(\frac{1}{3}\right)-\left[\left(\frac{1}{9}\right)\left(\frac{1}{3}\right)\right]^{-3}}$$

20. Reduce

$$A=\sqrt[b]{\frac{1+3^b}{1+3^{-b}}}+\sqrt[c]{\frac{1+4^c}{1+4^{-c}}}$$

21. Simplificar

$$E=\left\{m^{-1}\left[m\left(m^3\right)^{\frac{1}{2}}\right]^{\frac{1}{5}}\right\}^{-2}$$

22. Calcular

$$R=\sqrt[n]{\frac{3^{n+1}}{\sqrt[n+2]{9\sqrt{9^n}}}}$$

23. Calcular:

$$M=\sqrt[n]{\frac{6^n+10^n+15^n}{5^{-n}+2^{-n}+3^{-n}}}$$

24. Resolver

$$\sqrt[n-1]{\sqrt[3]{2^{3n-1}}}-\sqrt[3n-7]{8^{n-3}}=0$$

25. Resolver

$$\left(\frac{4}{3}\right)^{x-1}\sqrt{\frac{3}{4}}=\frac{16}{9}$$

26. Determinar el valor de:

$$E=\sqrt[n]{\frac{256^{n+1}\,.\,\sqrt[n+1]{4^{n^2-1}}}{64^{n+1}\,.\,\sqrt[n^{-1}]{4^{-1}}}}$$

27. Determinar el valor de:

$$A=\frac{5^{\frac{2a}{a-b}}+15\cdot 5^{\frac{2b}{a-b}}}{\sqrt[a-b]{5^{a+b}}}$$

28. Calcular A^2-1, si:

$$A=\sqrt[81^{3^n}]{\left[\sqrt[3]{216^{3^{3^{n+1}}}}\right]^{3^{3^n}}}$$

29. Simplificar

$$\sqrt[n]{\frac{x^{3n}+\sqrt[n]{\frac{x^{4n^2}+x^{3n^2}}{x^{2n^2}+x^{n^2}}}}{x^n+1}}$$

30. Simplificar

$$M=\sqrt[n]{x^n\cdot\sqrt[n]{x^{n^2}\cdot\sqrt[n]{x^{n^3}\cdot\sqrt[n]{x^{n^4}\ldots\sqrt[n]{x^{n^n}}}}}}$$

31. Efectuar

$$\frac{15^6\cdot 12^4\cdot 5^9\cdot 6^3}{10^{11}\cdot 3^{13}\cdot 5^4}$$

32. Simplificar

$$N=\frac{2^{n+4}-2^{n+3}}{2^{n+4}}$$

33. Calcular:

$$A=32^{25^{-8^{-3^{-1^8}}}}$$

34. Hallar el valor de :

$$M=\left[\frac{5^{n^2+3}-5^{n^2+2}+5^{n^2+1}}{5^{n^2+2}-5^{n^2}}\right]^{-1}$$

35. Reducir:

$$R=\left(\sqrt[\sqrt{2}]{4\,.\,2^{\sqrt{2}}}\right)^{(\sqrt{2}-1)}$$

36. Hallar el valor reducido de:

$$F=(0,1)^{-1}.\,(0,3).(0,5)^{-2}.\,(0,25)^{1/2}$$

37. Calcular:

$$X=\left(\left(\ldots\left(5^{10}\right)^9\ldots\right)^{-9}\right)^{-10}$$

38. Reducir:

$$M = \frac{(0,5)^{n-1} \,.\, 2^{n+1}}{(0,25)^{n+2} \,.\, 4^{n-2}}$$

39. Efectuar:

$$E = \frac{\sqrt[3/m]{(32)^{-9}\sqrt[4/3]{4^2}}}{(0,125)^{5m}}$$

40. Calcular $\left(\frac{2}{3}\right)^{a+b}$ sabiendo que:

    a) $2^{a+b} = 6^b$

    b) $3^a = 3(2^{b+1})$

41. Reducir:

$$A = (3^{27})^{3^7} : 3^{10} + 2^{-2}(-2)^2 - 2^{-2}(-2)^{-2}$$

42. Simplificar:

$$B = \sqrt[a-b]{\frac{xy}{\sqrt[b]{(xy)^a}}} \,.\, \sqrt[b-1]{\frac{xy^b}{\sqrt[b]{xy}}}$$

43. Reduciendo:

$$\frac{\sqrt{x^3.\sqrt{x^3}}}{\sqrt[3]{x^2.\sqrt[3]{x^2}}}$$

    obtenemos una expresión de la forma $\sqrt[a^2]{x^{b^2}}$, indicar $a + b$, si a, b son números naturales.

44. Reducir: Si $a^a = a + 1$; reducir:

$$Q = \sqrt[a^{a^a}]{(a+1)^{a+1}}$$

45. Calcular el valor de:

$$E = \log_5 125 + \log_{\sqrt{x}} x + 3^{\log_3 5} - 10^{\log 4}$$

46. Calcular:

$$P = 4^{\log_2 2} + 27^{\log_3 2}$$

47. Calcular x en :

$$x = \log_2 \log_3 3^{\log_{2,5} 6,25}$$

48. Calcular:

$$S = 9^{\log_2 5 \,.\, \log_3 2} + 4^{\log_{11} 3 \,.\, \log_2 11}$$

49. Calcular:

$$E = \log_{\sqrt{8}}(\log_{\sqrt{2}} 2)$$

50. Calcular:

$$S = \log_{16} \log_8 2\sqrt{2}$$

51. Reducir:

$$A = \log \frac{32}{243} + \log \frac{75}{16} + \frac{1}{3} \log 8 - 2 \log \frac{5}{9}$$

52. Calcular:

$$A = \log_2 5^{\log_5 2^{\log_2 7^{\log_7 5^{\log_5 8}}}}$$

53. Calcular el valor de:

$$E = \frac{\sqrt{30 + \sqrt{30 + \ldots (\infty \text{ radicales})}}}{\sqrt{6 + \sqrt{6 + \ldots (\infty \text{ radicales})}}}$$

54. Si

$$A = \sqrt{20 + \sqrt{20 + \sqrt{20 + \sqrt{20 + \ldots}}}}$$

    Además

$$Q = \sqrt[4]{A + 11 + \sqrt[4]{A + 11 + \ldots}}$$

    Determinar: $\sqrt[4]{Q^4 - Q}$

55. Calcular el valor de x:

$$x^{\log \sqrt{x}} = 100$$

56. Resolver:

$$\log_2 \log_3 (x + 2) = 2$$

57. Resolver:

$$\sqrt{\log x} = \log \sqrt{x}$$

58. Hallar x, si:

$$2 \log_9 (x + 4) = 1 + \log_3 x$$

59. Resolver:

$$x^{\log_2 x} = 16$$

60. Calcular:

$$\log(x + 1) + \log(2x - 1) = \log x$$